



U.S. Department  
of Transportation  
Federal Aviation  
Administration

# Advisory Circular

**Subject:** ~~PRODUCTION~~ UNDER ~~TYPE~~ CERTIFICATE  
ONLY

**Date:** 7/1/82  
**Initiated by:** AWS-200

**AC No:** 21-6A  
**Change:**

1. PURPOSE. This advisory circular provides information concerning Subpart F of Federal Aviation Regulations (FAR) Part 21 and sets forth an acceptable means, not the sole means, of ~~compliance~~ with its requirements.

2. CANCELLATION. Advisory Circular 21-6, Production Under Type Certificate Only, dated May 26, 1967.

3. RELATED FEDERAL AVIATION REGULATIONS. FAR Part 183

4. DEFINITIONS. As used herein, the following definitions apply:

a. Manufacturer. The holder or licensee of a type certificate, producing duplicate products in accordance with FAR Part 21, Subpart F.

b. Supplier. Any ~~person~~ who furnishes articles or services related to the manufacture of type certificated products.

c. Article. A material, part, component, assembly or appliance which is used in the type certificated product, as specified in the type design data,

d. Aircraft Certification Office (ACO). The office that administers the type certificate and production approval of products in the area where the manufacturer is located.

e. District Office. The FAA Manufacturing Inspection District Office ((MIDO)) responsible for the evaluation and the inspection of the manufacturer's facilities,

5. DISCUSSION. This advisory circular covers only those sections of FAR Part 21, Subpart F, where further discussion, information, or examples would be helpful. The headings of each of the following main paragraphs refers to the applicable section of Subpart F.

a. FAR 21.121 Applicability. The term "production under a type certificate only" refers to the production of a product by a type certificate holder or his licensee without related production certificate.

b. FAR 21.123 Production Under Type Certificate,

(1) A manufacturer who has been issued a type certificate (TC) is given six months under FAR 21.123(c) to establish and implement a production inspection system, unless the manufacturer has applied for a production certificate under FAR 21, Subpart G. During the six (6) month period from the date of issuance of the TC each completed product or part thereof is subject to FAA inspection prior to the issuance of airworthiness certificates. Because of limited monetary and manpower resources, these inspections may be delayed and/or very time consuming, and would normally allow a very low production rate by the manufacturer. It is, therefore, to the manufacturer's advantage to develop and implement an approvable production inspection system as quickly as possible. As the manufacturer's individual fabrication, assembly, and inspection operations are found to be in compliance with the regulations, they may be FAA approved on a progressive basis. When areas are found to be in compliance, the FAA may thereafter reduce its inspection and increase its reliance on the manufacturer's production inspection system. When the total production inspection system has been found in compliance with the regulations, the cognizant ACO will issue the letter of approval of the production-inspection system. Subsequent FAA inspections will be for the purpose of surveillance of the approved system to determine continued compliance.

(2) Upon the establishment of the production inspection system, FAR 21.123(d) requires the manufacturer to submit to the FAA a manual that describes the system and the means of making the determinations required by FAR 21.125(b). The local FAA Manufacturing Inspection District Office (MIDO) will evaluate the manual to determine whether the contents are adequate and provide a clear, completed description of the various systems, tests, procedures, records, and forms which will be the means for compliance with FAR 21.125 through 21.130. When the manual is considered acceptable, the district office will conduct a physical inspection of the various areas of the production inspection system.

(3) In the event a manufacturer does not establish and implement a production inspection system within six (6) months from the date of issuance of the TC, the manufacturer may request an extension of the time period when there are unusual or extenuating circumstances that would preclude the establishment of the production inspection system. A request for the extension may be made to the Regional Director of the Aircraft Certification Directorate. The request should include information, views, and arguments to substantiate that the reason for the extension was unavoidable. If the manufacturer does not establish and implement a production inspection at the end of the six (6) month period, and there are no extenuating circumstances to preclude the establishment and implementation, the FAA will discontinue inspections until an approvable system has been established.

c. FAR 21.125 Production Inspection System: Materials Review Board. The basic requirements for the production inspection system and materials review board are generally self-explanatory as outlined in FAR 21.125, and the following paragraphs provide an example of acceptable compliance:

(1) Materials Review Board. An effective materials review board is of primary importance in the functioning of an efficient production inspection system since it controls the inspection, identification, rework, and use of damaged or nonconforming articles, including the isolation or scrapping of unusable articles. The functions of the **board** are to determine that:

(a) Appropriate data is submitted to the FAA for engineering approval, when a materials review board decision results in a change to the product (reference FAR Part 21, Subpart D).

(b) Provisions are made for appropriate corrective action to preclude recurrences of discrepancies when the nonconforming, or otherwise unsatisfactory, articles result **from** deficiencies in manufacturing procedures, **processes**, design, or any other condition.

(c) ~~The~~ records required to be maintained are periodically reviewed and evaluated to determine the effectiveness of the corrective action program and to reveal problem areas as they arise.

(2) Suppliers. ~~The~~ system established for control of **incoming** materials and bought or subcontracted parts should provide for inspections and tests of such articles at the supplier's facility by the manufacturer, if the articles cannot or will not be completely inspected upon receipt at the manufacturer's plant.

(3) Storage and Issuance. A reliable, well-controlled storage and **issuance** system, for articles used in the **product**, is a major **factor in** manufacturing a conforming and safe product. ~~Some~~ of the objectives of such a system are to ensure **that**:

(a) Articles in storage are adequately protected, segregated, and identified;

(b) Articles subject to deterioration from prolonged storage are periodically reinspected and disposed of as required;

(c) Articles being delivered to, or stored in fabrication or shipping areas are protected from damage;

(d) All applicable design changes are incorporated prior to release of stored articles for **installation in** the product;

(e) Only those articles which are identified as having passed **company** inspection are received into and issued from finished stores.

(4) Processes. The production inspection system should be designed to ensure that each process or related service is performed by trained and qualified personnel, and that temperatures, solutions, curing times, or any other critical factors and **equipment are** periodically inspected, and that the inspections are documented. ~~These~~ processes or related **services** are accomplished to United States or recognized industry specifications when ~~derived~~ appropriate for the particular application. (Examples: Military **specification**, MIL-H-6088, "Heat Treatment of **Aluminum** Alloys," Federal specification,

~~Q-P-416~~, "Electro-deposition of Cadmium Plate," Aerospace Material specification, ~~AMS 2410~~, "Silver Plating, Nickel ~~Strike~~, High ~~Bake~~," etc.)

(5) Planning. The following paragraphs provide an example of an acceptable means of compliance with ~~EAR 21.125(b)(5)~~, which entails the establishment of a planning system that will ensure all **required** inspections and tests are conducted in the proper sequence, when articles and processes are in an inspectable ~~condition~~, as established by fabrication and inspection instructions, shop travelers, check lists, or similar **media**. Such a planning system should provide for the establishment and control of inspection ~~and~~ **dures** which ~~would~~ ensure that each article used in the product is inspected for **conformity** to the type design. The production inspection system should provide for:

(a) Classification of design characteristics **and** related manufacturing characteristics of all articles, processes, **services**, and the completed product, so that the most effective fabrication inspection methods and process controls would be used with respect to critical and major characteristics and defects.

(b) Selection of appropriate inspection methods and plans for each classification to assure that all characteristics affecting safety will be inspected, and reinspected as required, to assure conformity to approved design **data**.

(c) ~~Selection~~ and control of statistical **quality** control **methods** used on noncritical characteristics to assure that any nonconformities or defects which **may** be in a lot accepted under statistical **quality** control methods will not result in an unsafe condition in an end product or spare part.

(6) Inspection Stations. An effective production inspection system should **provide** for inspection stations at each major **stage** of production, maintain data, technical material, and records which **may** be required in the performance of inspections or tests at that particular **stage** of production. **To** ensure that all articles, processes, procedures, and the complete products are properly inspected, it is also normal procedure to employ a sufficient number of appropriately **qualified** inspectors to ensure that all required inspection ~~can be methodically performed~~ **with** no undue pressure **arising** because of production schedules.

(7) Inspection Status. Articles will be identified with stamps or marks traceable to the individual inspector, properly controlled to ensure that only articles which have been inspected and accepted are used in the finished product. **For** example:

(a) Suitable acceptance, **rework**, or rejection stamps should be **placed** on articles subjected to processing, testing; and inspection. Such stamps should be applied to articles subjected to heat-treating, welding, **soldering**, brazing, bonding, hardness tests, **proof** testing, laboratory analysis, radiographic inspection, ultrasonic inspection, magnetic particle inspection, etc.

(b) Articles which have been reworked and **accepted** as a result of materials review action must be so identified by a suitable stamp.

(c) Articles rejected as being unusable or scrap must be plainly ~~marked~~ and subsequently controlled so as to absolutely preclude their installation on the product or their use as spare parts.

(8) Tool and Gauge Control. An important function of a production inspection system is to provide for the inspection and the calibration, to certified measurement standards, of all inspection tools, gauges, testing equipment, as well as production jigs, fixtures, templates, etc., which are depended upon as media for acceptance. An effective schedule should have the inspection intervals established on the basis that such tools and gauges are inspected prior to their becoming inaccurate, to ensure timely adjustment, replacement, or repair. A record keeping system should ensure ~~that:~~

(a) Each piece of equipment is checked prior to first usage and at the proper periodic interval, ~~and~~ marked to indicate the date the next inspection is due;

(b) Each piece of ~~equipment~~ is removed from inspection and shop areas or conspicuously identified to preclude usage after expiration of the inspection due date; and that,

(c) Calibration standards are traceable to the U.S. National Bureau of Standards.

d. FAR 21.127 Tests: Aircraft.

(1) Prior to production flight test of aircraft any items ~~coming~~ under the provisions of Section 21.127(b)(5) should be checked. For example, it is important that:

(a) ~~The~~ means provided to level the aircraft are accurate and in conformity with ~~type~~ design data.

(b) Each aircraft is weighed to determine that the empty weight and center of gravity is in conformity-with the type design data.

(2) The flight test ~~procedure~~ and flight check-off form, ~~required~~ to be established and approved under FAR 21.127, should be ~~submitted to~~ the FAA Aircraft Certification Office for ~~approval~~, and may be included in the descriptive data discussed under paragraph ~~5b(2)~~.

e. FAR 21.128 Tests: Aircraft Engines.

(1) The test ~~equipment~~ used for the test runs should be capable of output ~~determinations~~ of accuracy sufficient to assure that the engine output delivered ~~complies~~ with the official ratings and operating limitations.

(2) ~~Following~~ the tests prescribed by FAR 21.128, each engine is subject to inspection by the FAA to determine that the engine is in condition for ~~safe~~ operation. Such inspection may also include internal inspection and examination to ensure that no ~~unsafe~~ condition exists. ~~The degree of~~ internal inspections will normally be determined by the ~~cumulative results~~

of such inspections conducted on the first production engines, and by service experience. The FAA ~~may~~ consider a statistical plan for internal engine inspections if the manufacturer ~~submits~~ a ~~proposal~~ based on product uniformity, a satisfactory history of previous internal inspections, and service experience.

f. FAR 21.129 Tests: Propellers.

(1) An acceptable functional test for variable pitch propellers would include 25 complete cycles of the control ~~throughout~~ the propeller pitch and rotational ~~speed~~ ranges. In addition, for feathering and/or reversing propellers, there should be accomplished five cycles of feathering operation and five cycles of reversing operation from the lowest normal pitch to the maximum reverse pitch.

(2) ~~Following~~ the functional test, each propeller is subject to inspection by the FAA in a similar manner as that ~~described~~ for engines in paragraph 5e(2) of this circular.

g. FAR 21.130 Statement of Conformity. Upon receipt of the statement of ~~conformity~~, the FAA will inspect the ~~completed~~ product to determine that it conforms to the type design and is in condition for safe operation. If so, an ~~airworthiness~~ certificate will be issued for aircraft, or an Airworthiness Approval ~~Tag~~, FAA Form 8130-3, will be issued for an engine or propeller.

h. General,

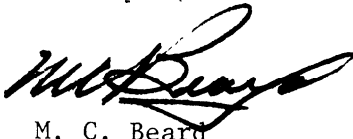
(1) Identification of Replacement Parts. Approved replacement parts ~~may~~ be identified:

a. with an FAA Form 8130-3 (Formerly FAA Form 186), Airworthiness Approval Tag. An Airworthiness Approval ~~Tag~~ identifies a part or group of parts that have been approved by authorized-FAA representatives, or

b. with a shipping ticket, invoice, or other document which provides evidence that the part was produced by a manufacturer holding an FAA Approved Production Inspection System issued under FAR Part 21, Subpart F.

c. Such parts ~~produced~~, which are not accompanied by either of the above listed items, are not considered to be FAA approved parts.

(2) Designated Manufacturing Inspection Representatives. Following approval of the production inspection system, the manufacturer may obtain the appointment of individuals in his employ as Designated Manufacturing Inspection Representatives (DMIR) for the purpose of issuing airworthiness certificates and/or ~~airworthiness~~ approval ~~tags~~. F A R P a r t 183).



M. C. Beard  
Director of Airworthiness



